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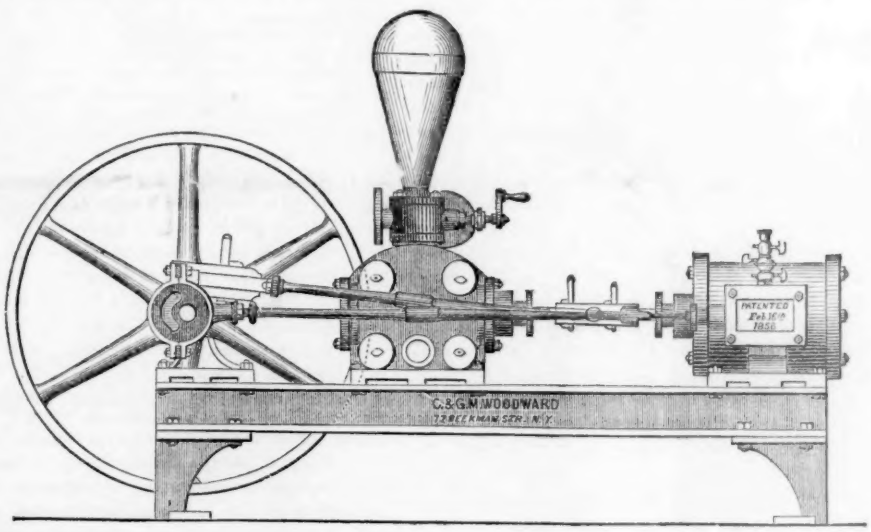
Woodward's Steam Pump.

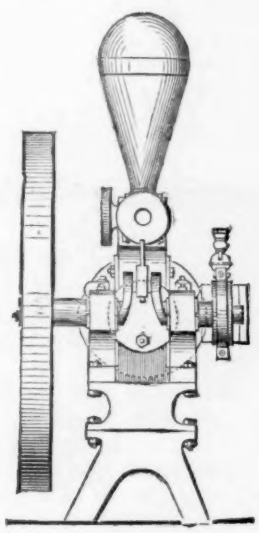
The art of raising, and supply of water has ever had a close connection with the progress of man in civilization, in fact, the state of this art among a people may be taken as a fair index of their social and moral status and position in the scale of refinement.

The most eminent mathematicians and engineers of old, made it a favorite subject of study, research and experiment, and their successors of modern days have attained to a degree of perfection in the mechanical appliances for this purpose, which perhaps is not excelled in any other branch of mechanical and scientific improvement.

In this connexion, we give herewith an illustration of Woodward's Patent Steam Pump, manufactured by the Woodward Steam Pump Manufacturing Company, corner of Centre and Worth streets, N. Y,

The first illustration gives a general view of the pump, Steam cylinder, balance-wheel, etc. The second figure is a cross section of the same, which will be readily understood by the observer. The pump is arranged with metal valves of peculiar construction, to give it strength and durability, and work in recesses secured with caps, which can be removed in a moment to get at any one of the valves, without taking any other portion of the pump apart. Cane juice and the water of many mines corrode iron. To prevent this the valves are made of gun metal, and the valve-ports and water-cylinder are bushed with the same alloy.





WOODWARD'S STEAM PUMP.

This pump is used for supplying Steam Boilers, Mills, and Public Buildings with water; also fitted as a fire apparatus in steamships and buildings of any description. In case of fire it is arranged to discharge any quantity of water according to size, by simply opening a valve connected with the discharge outlet. It can also be used for driving a fan, or light machinery. These pumps are now in successful operation in pumping molasses, hot syrup, mash, etc. As mining pumps they are unsurpassed, working in gold, silver, copper, iron and coal mines in the most satisfactory manner, lifting water from 25 to 30 feet, and forcing it over 500 feet perpendicular at the same time, and in quantities from 500 to 2,500 gallons per minute, according to size.

The simplicity of its construction, and the great power with which it is capable of forcing liquids commends it to all who give it a fair trial.

New Roofing.

The new Plastic Slate for roofing and other purposes, now being introduced by the Joint Stock Company, at 157 Broadway, seems to be a truly wonderful invention. How to produce a cheap and durable roofing is a question of no small importance when we consider the great advantage to the public interests a really safe and reliable substitute for the numerous inferior, perishable and unsafe materials now too generally employed for this purpose would be. The old-fashioned shingle roof may do for isolated buildings in a wooded country, where the risks of fire are limited, by being occasionally renewed, and tin and metallic roofs have their uses—and abuses—which is a renewal every few years, while the old roof lies an unsightly mass of old rusty metal, that even the junk man turns up his nose at. But the nuisance of patching or renewing shingle roofs, or soldering and tinkering a metal shelter at these auspicious or suspicious periods when the hygrometric condition of the atmosphere seems to permit it, is a matter to be taken into consideration when one's internal domestic arrangements and household goods, or perhaps more valuable and perishable stores are at the mercy of our very variable and capricious climate.

What we do want is an universally cheap and everlastingly durable weather and fire proof material, and this we believe we have found in the plastic slate roofing We have seen samples of it cut from a roof where it had been exposed five years, apparently solid slate, but adhering to the board so closely that nothing could separate it—a positive petrifaction, to all appearances The material is slate ground to a fine flour and mixed with mastic or some bituminous substance to the consistency of paint or paste, and is applied to canvass, cloth, paper, felt, wood, stone, metal or anything for a base. It then hardens, and by the action of the elements gradually petrifies or returns to a condition resembling the original slate, but less brittle and more elastic

There are various uses to which this material can be applied, such as cement for cisterns, tanks, cellar floors, and to stop leaks in old roofs of any kind, or in leaky hydrants, pipes, pumps, and the like. We saw an inkstand made from this material, and excellent slate boards for schools, etc. It can be applied as paint to wood to prevent decay, such as fences, fence-posts, and other exposed wood work. We predict for this material an immense popularity and demand, when all its valuable attributes are known to the public.

Geological Curiosity.—The *Nevada Transcript* of June 21st says: In the claim of Pond & Remington, at Little York, a geological curiosity was found a few days since. In stripping the bed rock in the cement clay, a lead of ribbon quartz, encased in slate, and and fourteen inches in width, was found. In a solid mass of hard quartz, several pieces of wash gold were found imbedded. The gold is worn smooth by the action of water and the pieces are worth from two to four bits each. Other particles of gold are found in the rock which are like quartz gold. The only ground upon which we can account for this is, that when the fissure in which the quartz is now found was being filled, and before the quartz became hardened or crystalized these pieces of wash gold fell from the face of the channel, which rests upon the bed rock and became encased. This theory does not agree with the one that quartz veins are the original source from which gold comes. The geologists who hold the latter theory will find it difficult to explain the existence of the wash gold in solid quartz.

—Interior California has, during the past month sent $3,000,000 in gold to San Francisco.

The Chemistry of Gas Lighting.

BY DR. LETHEBY.*

From the London Mechanics' Magazine.

The lecturer remarked that the object he had in view in the present instance was to take a rapid survey of the entire subject of the chemistry of gas manufacture. He did not intend to dwell particularly on any special set of facts; for, although every branch of the subject was full of interest, and might well be made the basis of elaborate investigation, yet the time at his disposal would not permit of anything more than a general and very cursory examination of the whole question. He would endeavor, therefore, to gather up the broad principles of chemical knowledge in this department of industry, and indicate their direct tendency. He hoped at a future time to have the opportunity of examining in detail the several branches of the subject; and at the very commencement of the inquiry it would be interesting to know something of the origin of the material which, as gas manufacturers, they had to operate. The question which here suggested itself was: Does chemistry throw any light upon the production of coal? There could be no doubt that it owed its origin to ligneous tissue. But how had it undergone those changes which had converted it into coal? Chemistry had pretty well investigated this subject, and had shown that the production of coal was clearly traced to the eremacausis, or slow combustion of ligneous tissue; and in looking to the modes of oxidation of woody matter, it would appear that there were three ways in which it could be, and no doubt was, effected. In the first place, it was partly effected by an internal change in the wood itself, whereby the elements—oxygen and hydrogen—associated and formed water, leaving the carbon free. In the second place, it was accomplished by the agency of water, the elements of which combined with carbon to form carbonic acid and marsh gas; and, thirdly, it was effected by the action of atmospheric oxygen slowly carried to the woody tissue by percolating water. All these changes were illustrated by diagrams and specimens of wood in every stage of change, from lignite and Bovey coal to anthracite.

FORMATION OF COAL

Oak wood	$C_{36}H_{22}O_{22}$
Oak Humus	$C_{35}H_{20}O_{20}$
Another Humus	$C_{34}H_{18}O_{18}$
Brown coal	$C_{28}H_{21}O_{16}$
Another coal	$C_{22}H_{15}O_9$
Cannel Coal	$C_{24}H_{13}O$
Caking coal	$C_{20}H_9O$
Anthracite	$C_{16}H$ O

It was scarcely within the province of the present lecture to enter upon a detailed inquiry as to the best kinds of coal for the manufacture of gas, and he did not propose to say more than that the coal must be of that description called bituminous. But it was a matter of considerable importance to know whether any particular coal would yield a fair average proportion of gas without submitting it to minute analysis. In referring, therefore, to the varities of coal which were best suited for the manufacture of gas, he directed attention to the rough test whereby the value of of coal might be estimated; as, for example, the specific gravity of the specimen, which should be close to 1·3, and the loss encountered when a given quantity of the coal, (say 100 grains) was ignited in a close vessel. The quality of the residue or coke was also an indication of the value of the coal for gas purposes; and the lecturer exhibited a diagram of the average, the maximum, and the minimum amounts of coke and volatile matters in all the leading varieties of coal.

But there were certain impurities in coal which it became necessary to recognize. The three principal were ash or mineral matter, sulphur, and water, each of which had a very important influence on the manufacture of gas. The normal proportions of these impurities were illustrated by a series of diagrams of the compositions of various gas coals.

The modes of estimating those impurities were also referred to; and in speaking of sulphur in coal, the lecturer alluded to the importance of making a selection of coals as free from it as possible, for Parliamentary legislation was manifestly towards the growing desire of the public to have gas with a minimum amount of sulphur. The means of determining the proportion of sulphur in coal were pointed out, and were illustrated by experiment. But, said the lecturer, there is another important question connected with this impurity in coal; in how many forms does it exist there? and of these which are the most pernicious? He stated that it might, to a small extent, be there in a free state, and that of the combined forms it was perhaps associated with organic matter, as well as with iron, (bisulphide of iron,) and with lime as gypsum. The relative importance of each of these forms was dwelt upon, and he spoke of the pyritic form as the most objectionable, because of its giving off its sulphur at that temperature which is most favorable for the production of bisulphide of carbon and sulpho hydrocarbons, both of which are unabsorbable impurities. The effect of moisture as an impurity was next referred to, and the lecturer explained how, when it was being distilled from the interior of a charge, and came into contact with the protosulphide of iron which had already parted with half of its sulphur, the aqueous vapor decomposed the sulphide, and formed sulpuretted hydrogen and oxide of iron, thus adding to the cost of the preparation.

The lecturer then directed attention to the facts which had been ascertained in respect of the temperature best suited for the destructive distillation of coal. He remarked generally that the action of heat on organic matters was to disturb the existing equilibrium of affinities, and thus to give the elements an opportunity of arranging themselves into other and simpler groups. The order of the movement of the molecules of organic matter, when subjected to heat, was somewhat as follows: After the hygrometric or physical moisture had been dissipated, oxygen was the first to start in the race for thermotic change. It combined with hydrogen to form water, with carbon to form carbonic acid, and with carbon and hydrogen to form acid and spirituous compounds, comparatively rich in oxygen and which are mixable with water. Next to move, perhaps, was the hydrogen in in its combination with carbon to form solid and liquid hydrocarbons of the nature of paraffin and paraffin oil and benzole, which were not mixable with water. At a higher temperature the nitrogen combined with hydrogen to form ammonia, and with carbon and hydrogen to form pyrogenous alkaloids, and with carbon alone to produce cyanogen. At this temperature also, the sulphur took hydrogen to form sulphuretted hydrogen, and then carbon and hydrogen to form the sulpho-carbo hydrogens; and lastly, with carbon alone to form bisulphide of carbon. Finally, gaseous hydrocarbons were freely produced; and during all the time of distillation, many of the primary compounds, by coming into contact with the red hot coke and with the sides of the retort, underwent change, and were converted into secondary products, as napthaline, &c.

The temperature at which these changes were effected had been tolerably well ascertained. Up to the temperature of 700° Fahr, little or no change was effected in the coal beyond the evolution of physical moisture. At the temperature of melting zinc, (773° Fahr.,) a little chemical moisture with an empyreumatic odor was produced. At 980°, which is a red heat just visible in the dark, water and fat oils—the paraffin series—begin to distil, but there is little or no gas. At 1500°, which is a cherry-red, gas of a high illuminating power is copiously evolved, and spirituous oils, rich in caroon, also appear. At a full red heat, (1800°,) and from this to incipient whiteness, permanent gases of poor illuminating power, as carbonic oxide, marsh gas, and hydrogen, and pernicious sulphur compounds, are freely evolved. Practically, therefore, it may be said that the best temperature for distilling common gas coals is a cherry-red, (1500°,) and for cannel coals a full red, (1800.)

In illustration of the difference of the products when cannel coals are distilled at a high and low temperature, Dr. Letheby alluded to the quality of the tar in the two cases. The tar produced at a high temperature was always heavier than water—specific gravity ·12 to 1·15; it dried freely in the air by oxidation; it contained hydrocarbons with such an excess of carbon, that they could not be burnt in a common lamp; they were almost totally destroyed by strong oil of vitriol; they contained sulphur, and their per centage composition was about 86 carbon, 7 hydrogen, 7 oxygen, and a little sulphur—about 0·5 per cent. Whereas the tar produced at a low temperature was lighter than water—about .900 specific gravity; it would not oxydate or dry in the air; it contained hydrocarbons of the paraffin series, which are comparativeiy poor in carbon, and which can be burnt in a lamp; they are not much acted upon by strong oil of vitriol; they contain but little or no sulphur, and their per centage composition is about 84 carbon, 12 hydrogen, and 4 oxygen. So also with the gases; at a temperature below 1800° they are rich in hydro-carbons of high illuminating power, and at a higher temperature they are comparatively poor in such hydro-carbons. The nature of the coal, of course makes a large difference in the results, but a general expression of the fact is, that high temperatures make a minimum quantity of tar, rich in carbon, and much gas, with comparatively poor illuminating power, and with large proportions of sulphur compounds.

(*Concluded in the next number.*)

* Abstract of a lecture delivered at Manchester, before the British Association of Gas Managers.

American Antiquities.

A letter from Middletown, Conn., says that wonderful discoveries have recently been made in the sandstone quarries of that place. The graves and mode of burial of a primitive race are found in the rock. The men are lying in one postion and the women in another. These men all had three fingers and a thumb, and four toes. The comparatively more recent of them were six to seven feet high, but as we unfold the leaves still further and proceed far back in the cycles of time to the lower depths of the rock, we come to a race of giants twelve feet high, with feet twenty-two inches in length. These men wore shoes, and had domestic animals of peculiar structure and great size. The only human instruments so far discovered were made of stone. They had sams and long knives made of slate.

We clip this from a cotemporary, but do not vouch for its truth. We have also seen reports going the rounds that the remains and relics of a former race of full grown pigmies of frequently not over thirty inches to three feet in height have lately been discovered in Tennessee and other southern states. Our antiquarians should look into this matter and explain these hidden mysteries of the past. We need not go to the old world to rake up the ashes of Herculaneum and Pompeii, or delve in the Catacombs of Egypt, to find materials of startling interest, pertaining to the past ages.

EXTRACTION OF QUINIA BY COAL OIL.—The heavy hydrocarburets (heavy oil) from the distillation of coal, can be used to extract quinia. The mixture of quinia and lime is dried as in the ordinary process, and then reduced to powder. It is then well mixed with the heavy oil in a copper vessel, sheeted with tin, and heated for one hour by steam at 212. You leave it to settle and decant, the operation being three or four times repeated. All the solutions are mixed together in a large vessel having a cork in the bottom. While shaking them well, add water acidulated with sulphuric acid, which uniting with the alkalies, pass in solution in water. When left to settle, the oil swims at the top. Decant the water, boil it with animal black, filter, and leave to crystalize. The oil can be used indefinitely for some other operations. One pound of good bark will yeild by this process, 220 grains of pure sulphate of quinia.

WHO DISCOVERED GOLD.—Cadmus is said to be the first who discovered gold. Some authors attribute its discovery to Thous of Thrace; others to Mercury, son of Jupiter; others to Pisus, King of Italy, who having left his country, went to Egypt, where he was chosen king after the death of Mizraim, and received the surname of God of Gold, on account of his discovery. Others say that Euclis or Coecus, son of Jupiter, or Sol, son of Oceanus, was the first who discovered gold. Eschyles thinks that Prometheus not only discovered gold but also other metals.

Matters in the Oil Regions.

Cor. N Y. Herald.

When "wild cat" ruled the roost in Oildom there was no lack of ready writers, or rather, sensation scribblers, to furnish Wall street and the people generally with the "very latest" every hour or two. A telegraph company put up their line and cleared their capital stock inside of three months, petroleum paying all expenses and leaving a handsome margin. But, now that speculatibe genius has departed, leaving the fate of this production in the hands of practical working men, it seems that Gotham has withdrawn the protecting light of her countenance, and left the poor borer to extract the grease from the bowels of the earth unaided and alone, while a ew of your merchants sit in their couting houses and deal in petroleum as they do in flour. This would be an excellent state of affairs if it could only continue; but the effect on the producing interest is such as to lead to a thorough investigation of the nature of this commodity and what position it is destined to assume in the commercial world. This investigation is rapidly going on, and the results will be ere long apparent; for the men who now hold the destinies of "grease" in their hands have about as clear heads on the subject of their own interests as any class of people I have ever met, from boot blacks to speculators in "western prairie lands." The present lack of interest in oil production is, of course, but the natural reaction of the intense excitement that prevailed for a time subsequent to its discovery, together with the fact that the great channel of demand is now partially closed by the war in Europe. The question then naturally arises, what will be the effect upon the oil producing interest if this state of things shall continue for a considerable length of time? I answer confidently, ruin, unless we can find a home demand for the amount that was formerly exported.

The present figures for crude at the wells vary from $2,25 to $3,25, according to the locality and gravity of the oil. At these rates wells which only yield a small or even average amount, cease to be profitable, and this must necessarily check the boring of new wells which are not already commenced or contracted for. Experience has shown that all wells exhaust themselves in time. The conclusion, then, is plain, that when the wells that now produce largely shall have become dry holes, petroleum will be left to lubricate the machinery of nature, instead of continuing an auxillary of Yankee invention and patent right.

This result will not be brought about, however without a fierce struggle on the part of producers, and almost criminal negligence on the part of capitalists.—The greater part of the supply at present comes from men whose pockets contain a healthy roll of greenbacks, and who are willing to use their last "stamp" rather than give up their hopes of large fortunes as the legitimate result of their hazardous labor. The pretty absurdity of plugging up the wells is, of course, not thought of by experienced men, as that has been thoroughly tested in days gone by, and invariably resulted in stopping the supply with a vengeance, and it is now universally acknowledged that oil, having once commenced to flow, will consinue to do so, if not in one direction then in another. A more practical method than this has been found, and is being put in operation, in the shape of large iron tanks capable of containing many hundreds and even thousands of barrels, into which the oil is allowed to run through iron pipes until full, when they are hermetically sealed to await a rise in the market. I would suggest, in this connection, that large excavations in the ground, lined with cement, would be far less expensive, and when closed less liable to accident from fire or other outside influences.

There is no disguising the fact, however, that the ultimate fate of petroleum rests with our capitalists.—Scientific experiments have shown conclusively that in the manufacture of gas and caloric it may be used to the greatest advantage, even at three times its present value. It is not in the power of the producer to create this new demand which alone can make his labor valuable, in the event of closing permanently the European market. If the demand becomes limited, it is evident that sooner or later he must sell, and if his margin be too small, as it must be, nothing remains but to retire from the field. The remedy lies in engaging the capitalist to work in harmony with the producer, and thus reap a mutual harvest instead of allowing a temporary cause to effect the permanent abandonment of one of our most valuable productions.

Fire Clays and Kaolin.

All clays, as they occur in nature, are essentially hydrated silicates of alumina. The value as fire clays, in the manufacture of pottery, crucibles, fire brick, etc., depends upon their elementary composition, which is always extremely variable. In the same location, often in the same pit and the same specimen even, great varieties are found Accordingly the formulae which have been employed to express the constitution of fire clays are quite discordant. As examples:

The clay used for crucibles in which cast steel is melted at St. Etienne, contains 58.75 silica; 25.10 alumina; 2 51 magnesia; 2 50 sesquioxide of iron; 11.05 water; with traces of lime.

The Stowbridge clay, used for crucibles, 63.30 Si.; 23.30 Al.; 1.80 iron; 10.30 water; with traces of lime.

The finest China clay or kaolin in Europe is found in Cornwall, an analysis of which is given as follows: 46.32 Si.; 39.84 Al; .36 lime; .44 manganese, .27 water of combination; 12 08 hygroscopic water.

The plasticity of clays depends upon their water of combination; when they have parted with that they can be no longer moulded into vessels All clays contain also hygroscopic water, which they part with at 100° centigrade, and the loss of which does not affect their plasticity. If we take a piece of clay and dry it in the sun, or in an oven heated to 100° centigrade, until it has lost all its hygroscopic water (that which it is capable of absorbing from the atmosphere), and then pound it up, we can, by applying more water, again mould it; but if we heat it to redness, we thereby drive off its water of combination, and it cannot again be made plastic. It will absorb water, but not the least degree of plasticity will appear, Pounded brick, or pottery, for instance, can never be moulded. In the manufacture of crucibles, a portion of the material used must be burned clay, or old crucibles, pounded up. This material, mixed with about two-thirds its bulk of raw or unburned clay, is rendered sufficiently plastic for the purpose. The presence of a portion of unburned clay is required to prevent them from cracking when exposed to the high heat of the furnace. The presence of iron pyrites is a fatal objection to the use of any clay for crucibles. The pyrites are really decomposed by the gasses in the furnace, leaving the crucibles porous and of course useless.

The quality of a fire clay in reference to its fitness for crucibles or fire brick, may be quite satisfactorily tested by thoroughly kneading a small quantity, and moulding it into such a shape as will present sharp edges. These pieces, when thoroughly dry, should be inclosed in a covered crucible and submitted to a high heat in a blast furnace. If the edges continue sharp and unchanged, the material may be considered good; but if they are much rounded, that may be looked upon as an evidence of incipient fusion; if they are melted, the clay is, of course, worthless. With a little practice, experiments in this manner may be made very satisfactory and reliable. Never build a furnace of untried material. The non-observance of this simple precaution has cost thousands of dollars in California.—*Mining Press.*

Why Does India Rubber Erase Pencil Marks from Paper?—It is explained thus: The pencil mark consists of carbon rubbed off from the black lead of the pencil; India rubber also consists mainly of carbon; and when the carbon of the rubber is brought in close contact with the carbon of the pencil mark in the process of rubbing, the smaller quantity of carbon in the pencil mark is attracted by the larger mass of carbon in the rubber, and thus removed from the paper.—*Ex.*

India rubber, when subjected to friction, becomes electrically excited, and attracts the particles of graphite (of which the pencil marks consist,) when loosened by the abrasion of rubbing. Hence a quick motion is more effective in removing pencil marks because the electrical excitetation and attraction is greater.—Eds.

Cannel Coal in the United States of Columbia.

Mr. May, an English engineer in the employ of the Columbian government, S. A., in his report published in the official journals of that Republic on October 31st, 1865, gives an account of the discovery in the province of Pio Hecha, of immense deposits of coal "of the variety called cannel;" and proposes that a railroad forty two miles long, from the mines to the sea be constructed, in order to make the new discovery available. In the course of the report, he gives a complete description of this species of coal, which we quote from the London *Colliery Guardian* of March 24th:

"Cannel coal is known in mineralogy as a black mineral having usually a slight tinge of grey; its texture is compact, and its fracture even or conchoidal with large cavities; its luster is resinous and glistening; it is sufficiently solid and hard to be cut and polished, and is the least brittle variety of coal. Its specific gravity varies from 1.23 to 1.27. It contains, according to Kirwan, carbon 75.2, bitumen 21.68, hydrogen 21.6, nitrogen 13.7. It burns without softening, with a large bright flame of short duration, leaving a sooty substance; and when the combustion is complete, there is an earthy residue of at least three per cent. Its heating power is the same as coke. Its odor, like that of jet, is not unpleasant. When placed on the fire, it often decrepitates and breaks into angular fragments. It is found in England at Wigan and Whitehaven, also at Gilmeston, in Scotland; there is also said to be a mine at Cape Breton, and a few others of little importance in the United States. It is employed, like jet, for making inkholders, toys, etc. When of fine quality, it does not soil the fingers, and it ignites and burns like a candle. It is used in England and the United States for fuel in the houses of wealthy people, either alone or mixed with other coal. It is the best coal known for making gas, and would be universally employed for that purpose, and for the extraction of kerosene, which it yields in abundance, but for its scarcity and high price. It is peculiarly suitable for heating the boilers of locomotives, and all other classes of steam engines, on account of its burning with a free flame. After engineers have done all they can, and have exhausted their skill and ingenuity to perfect the machinery of steamboats, the substitution of cannel for the ordinary fuels employed will give from twenty to twenty-five per cent. more velocity to a vessel. The weight and quantity of cannel coal required to produce a given effect are much less than when ordinary coal is burned; and all the American steamboats whenever high speed is required, use this coal either alone or mixed with other combustibles."

The Valley of ElMonte, California.—Some day, when railroads pass through this region, it will come out of the kinks and take its place in the front, as a wine, olive and orange producing country. The valley of San Bernardino appears about as large as Napa, from Sebastopol to Suscol, and presents at this time one mass of green. It is nearly every foot of it susceptible of irrigation, and produces, of hay in particular, immensely. A man told me he was mowing the third crop, and would surely cut the piece twice more this season. His hay was alfalfa—and yet with all its green grass and shady trees, you are not satisfied with the appearance of things—as in Hogarth's pictures, the animal, the gross, seems to predominate; the country lacks character, soul!"—*Cor. Mining & Scientific Press.*

[Advertisement.]

CASTINGS FOR GAS WORKS FOR SALE.

ONE COMPLETE SET HYDRAULIC MAINS for a bench of seven ovens, including Dip, Bridge, and Stand-pipes and Mouth-pieces for ovens of three retorts. Also, a COMPENSATOR, complete, and one EXHAUSTER, in perfect order, equal to passing Two Hundred and Fifty to Three Hundred Thousand feet of Gas per day. The whole, or separately, for sale low.

Apply at the Office of the
160-tf ALBANY GAS LIGHT COMPANY.

Productions of the Pacific.

In the early days of the gold excitement there were large shipments of sugar and kindred articles from the Atlantic cities to California, and the sales effected were at very remunerative rates. The production of sugar in the Sandwich and Society Islands was then in its infancy, and the quantity sent to market was far from being large. Of later years these islands have recieved a considerable number of American settlers, who have turned their attention to the development of the resources of that part of the world. So rapid has been the development that the sugar from the islands has taken complete possession of the market at San Francisco and other ports on the Pacific. The last cargo from the West Indies was sold at a loss of twenty-five per cent. to the shippers. Sugar refineries are established here for refining the sugars of the Pacific, and the enterprise is proving highly remunerative. The samples of Honolulu and Tahitian sugar made a better average appearance than most collections of samples in New Orleans or other ports on the sugar coast. Rice and coffee are contending sharply with those articles from the older sources of supply, but the large number of Chinese in California will always insure a steady sale for the rice from the Flowery Empire, without regard to the cheapness of other kinds.

SEA ISLAND COTTON.

I have been shown samples of Sea Island cotton from the Sandwich and Society Islands that compared favorably with that from the Atlantic States. The cotton culture in the Pacific Islands was greatly developed during our late war and the rates at which the article is sold render it highly remunerative. Cotton comes also from Lower California, and from some of the Mexican ports, sufficient in quantity to supply the cotton mills recently erected at Oakland, the Hoboken, of San Francisco. The finer cotton from the Pacific islands has been sent East for sale, and proves of superior fibre and fineness. Four hundred bales of Tahitian Sea Island cotton was sold recently to thread makers in Europe, and is reported as netting the planters four shillings sterling per pound. The sales thus far have been such as to give every encouragement to its culture, and it is not impossible that the islands may yet furnish a large portion of the best and most costly grades of cotton to the markets of the world. As the islands are being rapidly settled by Americans the cultivation of cotton will be likely to engross the first attention of our wandering sons, especially if they passed through the late excitement where cotton attracted all eyes toward itself in the vain effort to become king.—*Cor. N. Y. Herald.*

NEW QUALITIES AND ALLOYS OF IRON.—A French experimentalist found a few years since, that by heating iron tolerably free from carbon, with a small quantity of boron, to a very high temperature, he obtained a product which could not be forged, but which possessed extraordinary hardness. He has now found that an equally hard metal may be obtained by adding to cast iron, in fusion, phosphate of iron and peroxide of manganese. The product cannot be forged, but it casts easly, and is therefore, applicable to to the construction of such machines or parts of machines as require in their material extreme hardness rather than tenacity. The metal is sonorous, and the discoverer proposes it as a material for bells. He finds that a still harder metal is producible by the addition of tungsten to ordinary cast iron. He states that his tungsten iron surpasses everything previously known as a material for tools for cutting rocks, and that crystals of it will cut glass as readily as the diamond.

—An indestructible ink, which would be very useful for some purposes, may be made thus: Dissolve thirty grains of sugar in thirty grains of water, to which add a few drops of concentrated sulphuric acid. Upon heating this mixture the sugar becomes carbonized by the acid, and when applied to the paper it leaves a coating of carbon which cannot be washed off. This stain is rendered more perfect by the decomposing action of the ink itself upon the paper, and thus it resists the action of chemical agents.

PATENT CLAIMS.

Pertaining to Gas, Mining, Petroleum, Water, etc.

For the three weeks ending August 7, 1866.

56,549—APPARATUS FOR TREATING ORES WITH CHLORINE.—Eugene Gaussoin, Baltimore, Md.

I claim, 1st, The inclosing walls and floor, forming chambers in which the barrels revolve, and from which the fluid contents are removed by drains from the sides and the solid by an aperture at the corner of the arch

2d, The combination of the hollow axles and perforated walls, forming a series of connections from the generator, from barrel to barrel, and ultimately to the discharge appertures at the summit

3d, The arrangement of the barrels with their operating gearing, so that their respective openings are in revolution presented alternately to the openings of the ones next in series above, and next below, to afford the means of discharging, as described.

4th, The combination of the revolving barrels and the openings, J, and the side openings, H, as and for the purpose described.

5th, The combination of the valve, K, with the drains, Y, Y, W as and for the purpose described.

56,581—QUARTZ CRUSHER.—John Mabbs, Isle Royal Mines, Mich.:

I claim, 1st, The feed-table, J, mounted in the tubular shaft, H, in combination with the mullers, F, and main-shaft, B, constructed and operating substantially as and for the purposes described.

2d, The plow, L, in combination with the feed table, J, tubular shaft, H, and horizontal shaft, E, constructed and operating substantially as and for the purposes set forth.

3d, The tank, O, in combination with the plow, L, feed-table, J, and mullers, F, constructed and operating substantially as and for the purposes described.

55,626—PEAT MACHINE.—M. B. Stafford, New York City:

I claim, 1st, The constructing of the molds, C, of two longitudinal parts or halves connected by hinges and so arranged as to form an endless chain of molds to work over rollers and receive the peat or other substance to be compressed and to discharge the same after being compressed, by passing over the roller at the discharge end of the framing, substantially as set forth.

2d, The plunger, E, operated as shown in combination with the endless chain of molds, substantially as and for the purpose specified.

3d, The hopper, M, provided with one or more partitions, l, provided with teeth, m, at their lower edges, in combination with the endless chain of molds, c, substantially as and for the purpose set forth.

55,629—PROCESS OF BURNING GAS FOR THE PRODUCTION OF HEAT, LIGHT, &C.—Simon Stevens, New York City:

I claim the mixture of steam with coal gas or other gases produced by distillation of hydro-carbon substances, or their equivalents, so as to render it more useful for the production of heat and ligh, as herein described.

56,768—QUARTZ CRUSHER.—A. Lindsey, Malone, N. Y.

I claim, 1st, The combination of the rollers, E, with the axles, e, pins, f, and upright shaft, B, substantially as set forth and in the manner described.

2d, The combination of brushes or scrapers, G, with bars, g, and g', springs g^*, friction rollers, g'', rollers, j', and cams, j, substantially as shown and described

3d, Returning the coarse quartz to the crusher by means of selves or separators, n, trough, n^2, box, M, endless apron, N, hopper, J, and pipe, t, substantially as shown and described.

4th, The device for lowering or raising the brushes or scrapers, c, consisting of cam, j, rod, i, shell, i', and spiral spring, i^{*2}, substantially as herein shown and described.

56,793—QUARTZ CRUSHER.—Henry Pearce, San Francisco, Cal.

I claim the construction of a conically-shaped crushing mill with an eccentric motion as herein described, for the purpose and in the manner substantially as set forth.

56,836—SAFETY ATTACHMENT FOR GAS PIPE.—L. W. Turrel, Samuel Stanton, and L. C. Ward, Newburgh, N. Y.

We claim the combination of the gauze disks, C C C, rings, D D, and coupling, A B, arranged and applied in the manner and for the purposes specified.

56,843—APPARATUS FOR THE MANUFACTURE OF GAS FROM PETROLEUM.—William C. Wren and William Barker, Brooklyn, N. Y.

We claim the process herein described of producing gas, to wit: by a combination of one or more heaters and super-heaters (not less than one of each) continuously connected with each other by pipes, such heaters and super-heaters fitted and filled as described in the foregoing specification, and by the peculiar combination, arrangement and graduation of two or more fires, not less than two, as shown in specification, with an addition of more heaters, superheaters, and fires, as the quantity of gas to be produced may require.

56,852—APPARATUS FOR DISTILLING PETROLEUM.—M. P. Ewing (assignor through mesne assignments to H. B. Everett and P. Ewing,) Rochester, N. Y.

I claim, 1st, The combination of a continuous feed with a vacuum still for petroleum, operating substantially as and for the purpose herein set forth.

2d, The combination of a jet condenser with a vacuum still for petroleum, operating substantially in the manner and for the purpose herein specified.

3d, The combination of the two or more condensers, H H, with each other and a vacuum still, A, in such a manner that the action may be alternated from one to another to preserve the vacuum, and to allow of the constant running of the still, as set forth.

4th, The arrangement as a whole, consisting of the retort, A, condensers, H H, connected by the tubes, G G, and pipes, I I', operating substantially as and for the purpose specified.

56,915—SAFETY CAGE FOR MINES.—John Evans, Virginia City, Nevada.

I claim the employment or use of the lever, A, spring-bar, B, with the friction roller, e, and guide-pin, d, or their equivalents, when arranged substantially as described, and for the purpose set forth.

56,949—AERO-GAS BURNER.—Wm. Jones and M. H. Collins, Chelsea, Mass.

We claim the improved aero-gas burner, that is, one made with or having a means of closing and more or less opening its air inlet or inlets, as specified.

We also claim the combination of the removable deflecting dome or cap, C, made with eduction orifices in it and near its base or lower part, with the aero-gas burner, as specified.

We also claim the peculiar mode as described, in which to construct the aero-gas burner, viz: by uniting its two parts, A B, by screws, a b, and arranging the air inlet holes of the upper part, A, with respect to such screws, in a manner as described.

57,006—GAS MAIN.—I. N. Stanley, Brooklyn, N.Y.

I claim, as an improvement in hydraulic mains for gas works, the combination with the elliptical or cylindrical main-pipe, C, of the external supply-tubes, D D D, cast in one piece with the pipe, c, and communicating with the lower part of the latter, as herein specified and for the purposes set forth.

[this main was illustrated and described in No. 2 of the present volume of this Journal.]

57,019—GAS APPARATUS.—Wm Warner and E. S. Redstreake, Philadelphia, Pa.

We claim, 1st, The combination of spiral or other springs with the disks, D D, and D D, arranged and operating substantially in the manner and for the purpose above set forth.

2d, The combination of the induction-pipes, B, a, exit-pipe, C, and disks, D, with the vessel, A, the whole being constructed and arranged in relation to each other for joint operation, substantially as described and for the purposes specified.

Brevities.

—The thickness of the film of a soap bubble has been ascertained to vary from 1-19,000th to 1-35,000th of an inch.

—A Louisville photographist has taken some wonerful views of the Mammoth Cave with the magnesium light.

—A patent fish scaler is the latest Connecticut invention.

—Miss Fanny Forrest a young lady of fine promise, a niece of General Forrest, was so badly burned by the explosion of a can of coal oil at Hannibal, Missouri, on Monday night, that she survived but a few hours.

—The New Bedford (Mass.) *Standard* says the petroleum street lamps in that town explode occasionally, especially during the hottest evenings. The oil runs over from the wicks, takes fire outside of the lamps, heats them till the solder gives way, and the whole explodes.

—Lead and zinc veins have been traced through several counties in Tennesee. One vein from Elizabethton, in Carter county, through New Market Valley, and into Anderson county, and continuing to Blount county, Powell's Valley. Lead and zinc are associated together, and are found embodied in limestone strata.

—In Canada are vast deposits of asphaltum, or mineral pitch, which the inhabitants call gum beds. A cubic foot of this asphaltum represents the effusion of not less than sixty to eighty cubic feet of lubricating oil, and from one hundred to one hundred and twenty feet of illumiating oil. Some of the best wells in Canada are sunk on or near these gum beds.

MANUFACTURE OF TIN PLATE.—During the last seven years the annual average value of the tin plates manufactured in Great Britain, and shipped for exportation, amounted to more than $5,000,000. The largest amount, to the value of $3,590,000, is shipped to the United States. It is to be hoped that the mines of California will soon enable us to furnish our own tin.

STEAM JETS.—It may be interesting to know that the application of the steam jet can be traced back to the time of the ancient Romans. Ewbank, in his work on "Hydraulics," gives some interesting particulars on the subject, and shows that blowing fires by a jet of steam, either into the fire or up the chimney (like the modern (?) steam jet), is of very ancient application.

A NEW KIND OF FUEL.—The Cleveland (Ohio) *Herald* asserts that some of the lake steamboats are using fish for fuel! Huge 60-pound sturgeons are thrown head foremost into the furnaces, with a little wood. The oil assists the combustion of the wood; and twenty sturgeons are said to be quite equal to a cord of wood in the production of heat

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Have a large and very choice assortment of GAS FIXTURES, which they offer at reduced prices, in view of the recent fall in gold. Their *Glass and Fire Gilt Chandeliers, are of entirely new designs,*

And well worthy of attention by those who wish to purchase

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J. WALTER CLARK, Accountant. J. M. DUCLOS, Arch.

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For Wet Meters, Gasoline Machines, Hydraulic Presses, &c.

We warrant our Glycerine free from acid and not to corrode the Meter metal, or to congeal or freeze at a stated temperature—also, not to evaporate to any extent. The advantages and savings derived from the use of our fluid can be testified by many Gas Light Companies which we have supplied. We only refer to the certificates of H. J. Miller, Esq., President of Cincinnati G. L. and Coke Co., and Dr J. Lawrence Smith, Professor of Chemistry in the Louisville College, and President of the Louisville Gas Co.

HARTMAN & LAIST.

Office No. 71 Main street, Cincinnati.—Chemical Works on Providence st. and Miami Canal, near Findlay st.

CERTIFICATE.

Office Louisville Gas Co., Louisville, June 28, 1865

This is to certify, that the Louisville Gas Co have used for about two years, the Glycerine prepared by Messrs. Hartman & Laist of Cincinnati in their Wet Meters, and have in all instances found it to give most perfect satisfaction. Prior to the use of the above Glycerin, we had employed that manufactured by other parties, and we consider H. & L.'s superior to any we used.

J. LAWRENCE SMITH, President.

Office Cincinnati Gas Light and Coke Co., July 7, 1865.

This will certify, that Messrs. Hartman & Laist of Cincinnati, furnished this Company with Glycerin for Wet Meters some two years since. It has proved very satisfactory, having resisted the action of frost during two winters and evaporating not more than six per cent. per annum, as guaranteed by them. The standard being, for density, 15 deg Beaume's scale. They were the first to introduce it practically to this Company. H. J. MILLER, President.

☞ L. BRUCKMAN, 107 Warren street, up-stairs, Agent for New York.

KEROSENE

Cooking Apparatus.

All the cooking for a family can be done with Kerosene Oil, with less trouble and at less expense than by any other fuel.

Our stoves give no smoke or odor, and are not liable to get out of order, being as simple in every respect as a kerosene lamp. The Baker, Boiler, and Flat-Iron Heater are the only special articles of furniture required. For all other purposes, ordinary stove furniture may be used.

We would call attention to the fact that for the past three years, the Company has devoted itself almost exclusively to the manufacture of Kerosene Cooking Apparatus, and is prepared to guarantee that every article shall perform all that is claimed for it.

Liberal discounts to the trade. Send for circulars and price list.

KEROSENE LAMP HEATER CO.,

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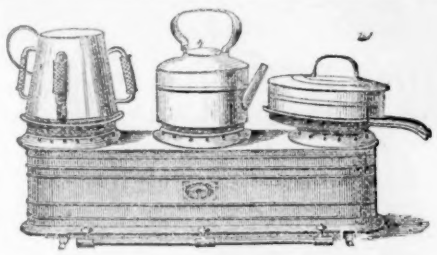

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CHEAPER THAN COAL OR WOOD.

The "EAGLE" Gas Heating
STOVES,

Positively guaranteed free from Smoke or Smell.

Will Heat Offices, Parlors, Dining, Sleeping, and Bat Rooms. Also,

The EAGLE Gas Cooking
STOVES & RANGES,

Will Boil, Broil, Roast, Bake, Toast, Stew, and Heat Irons.

The EAGLE GAS STOVES and RANGES have been in use for over Three years, and are found to be the most SIMPLE, COMPLETE and PERFECT Arrangment for HEATING and COOKING, in every respect ever invented, and to do the Work with LESS TROUBLE, in LESS TIME and at LESS EXPENSE than any Coal or Wood stove.

Their WONDERFUL NEATNESS, CONVENIENCE and ECONOMY can be seen at a glance.

WE ALSO MANUFACTURE

COAL OIL STOVES,

For Cooking and Heating.

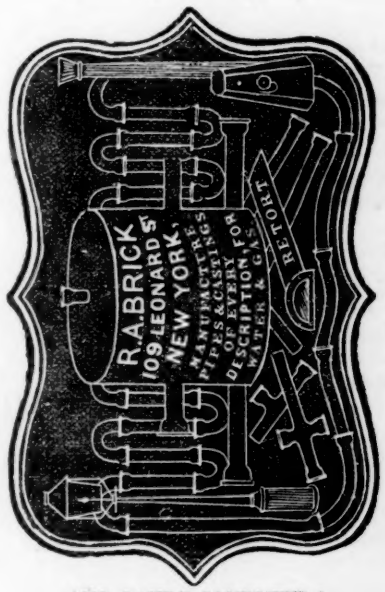
The American Advertising agency 389 Broadway, N. Y. Bus. Dept., E. Alvord, cor. Dept., Fowler & Wells, receive orders for our stoves.

EAGLE GAS STOVE MANUFACTURING CO.
No. 474 BROADWAY, N. Y

☞ The Company have descriptive Catalogues, which will be sent or delivered, upon application for them.

DRIVING PIPE,

BERGEN IRON WORKS,



OFFICE 109 LEONARD STREET, NEW YORK.

AND BANDS COMPLETE.

Mining & Petroleum Standard
AND
AMERICAN GAS-LIGHT JOURNAL.
Published on the 2d and 16th of Each Month
At No. 22 Pine Street, New York.
BRYANT, CALLENDER & CO.,
EDITORS AND PROPRIETORS.
Profs. PARTZ & BUCK, Consulting Chemists.
THURSDAY, AUGUST 16, 1866.

WISHING TO MAKE this Journal an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its colums aad devoted, the publishers solicit letters from all among them who make the study of those subjects a pleasure, or a profession.

SUBSCRIBERS would confer a favor upon us by remitting CHECKS, or POST OFFICE MONEY ORDERS, as we are frequent losers where money is enclosed in letters.

CONTENTS.

Woodward's Steam Pump, Illus.	49	Steam Jets,	52
New Roofing.	49	New Qualities and Alloys of Iron.	52
Geological Curiosity.	49	Brevities	52
The Chemistry of Gas Lighting.	50	Patent Claims,	52
Extraction of Quinia by Coal Oil.	50	Coal Fuel.—Its economy and substitutes,	56
Who Discovered Gold.	51	Brooklyn Tube Works.	56
Matters in the Oil Regions.	51	The Calcago River to be Tunneled	57
Fire Clays and Kaolin.	51	An Amalgam of Magnesium.	57
Why does India Rubber efface Pencil marks.	51	Complimentary Resolutions,	57
Cannel Coal in the United States of Columbia.	51	Webster's Patent Wrench.	64
The Berdan Gun.	51	Voltaic Action	64
The Valley of El Monte, Cal.	51	Permanent Drying up of the Mississippi.	64
Productions of the Pacific.	52	Slate Quarries.	64
		Mining in Colorado, etc.	64

Coal Fuel—Its Economy and Substitutes.

In a late issue we had occasion to notice the recent discussion before the British Parliament by Mr. Gladstone, upon the increased production of coal in the United Kingdom, and the probable eventual exhaustion of all the coals accessible within 4,000 feet of the surface of the earth within a period of about 100 years.

At first thought this may appear to be a serious matter for a people whose present advancement in commerce, art, science and civilization so much depends upon the cheap price at which coal can be produced. But we must not lose sight of the fact that science is progressive, and that the inquiring mind is ever on the alert to improve the various appliances now in use, where coal or other fuel is employed, to more completely utilize and economize the caloric evolved during combustion, to devise more economy in mining, and to discover and apply substitutes for coal fuel.

Take as a period the last fifty years and see what improvements have been made in this direction.—While our forefathers were content to warm the humble cottage by the aid of the "fire-place" which occupied one side of the dwelling, whose capacious jambs required the immense "back-log" and "fore-stick," and the various components to form the huge pile for a respectable fire, their children employed the "box" and "Franklin" stoves, etc., which used both coal and wood, and were scientifically an improvement in the degree of radiation attained, and because they did not carry the most of the caloric up the chimney in a tempest.

From this we come to the more modern and scientific appliances for heating, cooking, etc., embracing heaters and registers, radiators, base-burners, smoke and gas-consumers, patent cooking stoves ranges, galleys, and numberless other inventions. So also in equal or greater degree has there been improvements in the various processes of smelting, and in steam engines—both land and marine—by the aid of improved draft or blast, by return, horizontal and inclined flues, patent jackets, grates, condensers, etc., to more completely consume the smoke and gases, to increase the radiating surfaces, and various other improvements, until, when we look back to the old methods, we smile at their primitiveness and inefficiency.

It is safe to say that by modern improvements we get from one to two hundred per cent. more caloric or *work* (which is but another name for it) from a given amount of fuel consumed than we did fifty, or even twenty-five years ago; and there is no reason to believe the inventive genius of the age will not improve upon the present methods of consuming fuel economically during the next hundred years in a similar ratio at least.

SUBSTITUTES FOR COAL—*Wood.*—As a substitute for coal fuel wood is hardly worth taking into consideration, so far as England is concerned, for her forests have long since failed to furnish any considerable amount of fuel for practical purposes. In this country the case is somewhat different, but even here our wooded regions are being rapidly denuded, and cannot long be considered as an essential element upon which to base an estimate for heat-giving purposes.

Small Coal or Culium—There is a great proportion of coal lost in working in all mines in the form of "culium," or small coal, which accumulates in the vicinity of mines, and wherever the coal is handled, and broken and assorted by machinery or otherwise ready for market. But a still greater loss occurs in the process of mining, which leaves a debris that is valueless to the owner, as no market can be obtained for it. A prominent English engineer, Mr. Alexander Bassett, in a late communication upon this subject, estimates the loss at about 30 per cent. of the actual contents of the seam or vein of coal, and that even a higher percentage was lost in some of the English steam collieries.

Several patents have been taken out in this country to convert fine, non-bituminous coal into blocks, but they all, so far as we are aware, require the use of expensive ingredients to cause adhesion of the mass, which detracts from the value of the invention. The same difficulty exists in England, but we have no doubt the art of manufacturing "compressed coal" or "patent fuel" will eventually be perfected without the aid of an adhesive or cement.

Coal Oil or Petroleum as a substitute for coal fuel, is already a fixed fact, especially for heating and cooking purposes, and is being rapidly brought into use both here and in Europe. But its application in the various processes of smelting ore, working metals, glass, pottery, etc., and for generating steam, is of much more importance; and almost daily we see a notice of some new invention for these purposes, and experiments of a favorable character in this connection. The Board of Admiralty in England have lately made a report favorable to the use of petroleum in marine steam engines, and asserted that it possessed advantages in point of economy over coal, taking all things into consideration.

Peat Fuel—But aside from the foregoing reflections we have a substitute for coal of too great importance to be overlooked, and which must go far to modify our estimates in regard to the possible exhaustion of coal fuel. We refer to *peat*, which is beginning to attract the attention of not only scientific men, but the practical economist, the capitalist and the public at large.

Voltaic Heat—The generation of heat, and also light, by galvanic agency seems to open an interesting and favorable field for scientific experiment. That a high degree of heat can be obtained by this method, and which is difficult if not impossible to excel by any other method, is a fact known to science since the experiments of Sir Humphrey Davy, when by its aid he converted the diamond to a gaseous form, and performed the still more wonderful experiment of reducing the oxides of potassium and other metalloids to their elementary or metallic state. At present the cost precludes the use of this agent for general purposes. The French Goverment has offered a prize of $10,000 for the best discovery for the utilization of the voltaic pile. Competition is to continue for five years, and we are sanguine a great advancement in its practical and economical operation will be made within that period.

Carburetted Hydrogen, or Illuminating Gas, were it not too expensive, would be valuable for heating purposes in place of coal, and there are various appliances now in use where its convenience gives it the preference for heating, cooking, &c., and in some of the arts.

Hydrogen, burned in the open air—or better, with a strong draft of atmospheric air—is susceptible of producing great heat that can be used advantageously in the arts, and, in fact for almost all operations where artificial heat is needed; and recent experiments by the Gwynn process, at Elizabeth, N. J., go to show that it can be produced very cheaply—as low, it is estimated, as 25 cents per 1,000 cubic feet. In this process superheated steam is decomposed by the aid of incandescent coke or coal. If further experiment uphold this estimate, we may soon see a revolution in the science of heating and illumination.

Oxy-Hydrogen, &c.—As a powerful calorific agent, the gases of oxygen and hydrogen have long been known and used in the labratory of the chemist, but the cost of these gases, also, has been too high to admit of their being used in a large way.—It is well known that water contain the elements (oxygen and hydrogen) in the exact proportions to produce a very high degree of heat—capable of reducing the most refractory substances, and whoever will discover a cheap method of decomposing water so as to re-unite its elements for heat and light-giving purposes will not only immortalize himself, but advance the general interests of mankind at once far beyond any discovery that has occurred since the world began.

Brooklyn Tube Works.

We recently had occasion to visit the extensive Brooklyn Tube works, owned by Mr. B. T. BENTON, at the corner of John and Adams-sts., Brooklyn, and could not help but admire the simplicity and order with which the work is done under the care of the gentlemanly and efficient Superintendent, Mr. JAMES MOREHEAD.

The building is of brick, about 50 x 150 feet, and three stories high. Only the ground floor is devoted to the tube manufacturing. Here we find a large steam engine of 60-horse power moving as silently as a clock, and giving motion to the various machines and driving the air-blast for the furnaces. The forges or furnaces are sufficiently long to take in the "skelps" or flat strips of metal the length of the intended tube; this is first heated to a deep red and then drawn out through an adjustable die which gives it the form of a long trough. There is an endless chain extending from the mouth of the furnace in a direct line which carries and sustains the red hot metal as it is drawn through the die. A little iron car runs to and fro astride of the chain and carries a clamp or tongs, and which is attached to the moving chain at the same time that it seizes upon the end of the iron strip or tube projecting through the die, and continues to draw it out to the end, when the clamp is loosened by an automatic arrangement and the trough or semi-tube is dropped off upon a

pile of its fellows It is then taken to the "welding furnace" and one-half its length subjected to a heat of about 1900° Fahrenheit, and then again drawn through a smaller die by a similar process, which reduces the diameter and closes the space or seam, completing that part of the tube. As it is cast off from the endless chain a workman seizes it and palancing it upon a rest swings the glowing half under the "rolling table," which consists of a smooth iron bed and a heavy top plate which slides to and fro upon it by means of a cam motion, and gives the tube a rolling motion between them, serving to straighten it and give a density and smoothness to its surface. A rose-jet of water is projected constantly upon the table which keeps it cool and cools the tube at the same time. It is then taken back to the welding furnace and the unfinished half goes through a similar process, and the tube is finished.

When a tube is to be of large diameter and heavy, a machine called a "crocodile" is used, consisting of two powerful hinged iron jaws about six feet broad, the lower jaw stationary and groved in its breadth, while the upper one is moveable and has a "former" to fit the groove. The "skelp" is heated and placed between these jaws which force it into a half round or trough form. It is then passed into the welding furnace and through the reducing and finishing dies, as before described, to complete the tube.

The tubes are subsequently placed in a cutting machine, something like a lathe, which cuts off the ends truly with a revolving cutter, and then a screw die is brought to bear, which cuts the screw thread to fit the joints, couplings, etc. They are then placed in a hydraulic press or testing machine which forces water into them with a degree of pressure sufficient to prove their perfection for the use intend ed, after which they are ready for market.

There are other screw-cutting or tap machines for cutting nuts, couplings, thimbles, etc., for the pipes one of which in particular, operated three vertical cutting taps at a time, which requires but one workman to tend.

The 2d floor is in part occupied by lathes and machinery for fitting and finishing brass cocks, and other gas and water fittings, in connection with the pipe works, and in part by W. C. Vosburgh & Co., manufacturers of gas fixtures and fittings. Mr. Cornelius Day, of this firm has invented a very useful machine for drilling, at one operation, from one to three holes, at any angle, for screw and key fittings for gas brackets, etc. We intend to notice this piece of mechanism more in detail hereafter.

The upper story is occupied as a button manufactory. All the machinery throughout is driven by the engine before mentioned. Mr. Benton truly is deserving of credit for his enterprise in establishing so valuable a branch of manufacture in this section.

Complimentary Resolutions.

Office Yonkers Gas Light Co.,
Yonkers, 18th July, 1866.

At a meeting of the Board of Directors of the Yonkers Gas Light Co, held on ohe 11th July, 1866, Mr. William. R. Beal, Superintendent, informed the Board that he had made engagements el-ewhere which he thought more advantageous to him than his position in this Company, and he therefore desired to offer his resignation, to take effect on the first of August, proximo.

At a meeting of the Board held this day, the following resolutions were adopted:

Resolved, That the resignation of Mr. Wm. R. Beal as Superintendent of this Company, be accepted, to take effect on the 1st August, proximo.

Resolved, That on the voluntary withdrawal of Mr. Beal from the employ of this Company, after having been its Superintendent for the long period of nearly nearly twelve years, this Board thanks him for his services in the past, and extends to him its best wishes for his success in the future.

Resolved, That a copy of this resolution, signed by the President and Secretary, be presented to Mr. Beal, and also published in the village newspapers.

Thomas C. Cornell, Pres't.
Wm. W. Scrugham, Sec'y.

The Chicago River to be Tunneled.—In addition to the great lake tunnel at Chicago, which extends several thousand feet into the lake, and from which the city is to derive its supply of water, an other immense tunnel is projected, to extend under the south branch of the Chicago River. It is to consist of three passage-ways—two of eleven and one of ten feet in width, and fifteen feet high, and the length of the covered portion will be about one thousand feet. The advertisement for proposals to build this immense tunnel will be found in our advertising columns, and we are informed by Mr. A. W. Tinkham, Esq., Secretary of the Board of Public Works, that the work will be commenced and prosecutee without delay.

An Amalgam of Magnesium may be formed if the mercury is heated, and will oxidize with wonderful rapidity, decomposing cold water with copious evolution of the hydrogen gas, even when the amount of magnesium present is but a small percentage.—*Ex. from proceedings of Franklin Ins.*

Prof. Henry Wurtz, of this city, we believe has patented and employs a similar amalgam (the same as he does his sodium amalgam) in metallurgical operations, to more completely amalgamate the precious metals, gold ond silver, whereby a great saving is made.

Tin Ore in Maine.—A company of Eastern capitalists, known as the National Tin Mining Company, with their office at No 64 Broadway, N. Y, has been organized to work a tin mine in Oxford county, Maine.

PROPOSALS FOR A TUNNEL UNDER CHICAGO RIVER.

Office of the Board of Public Works,
Chicago, August 1st, 1866.

Sealed Proposals will be received by the Board of Public Works, at their office, until 11 a. m Saturday, August 18th, for the construction of a Tunnel under the South Branch of Chicago River, at Washington-st., according to plans and specifications which will be on file at said office and ready for examination on and after August 8th.

The Tunnel under the river is to consist of three passage-ways, the outside ones to be each 11 feet wide and 15 feet high, and the middle one 10 feet wide and 15 feet high. The middle passage way to terminate near the river on each side in stairways to the street. Between the stairways and the ends of the covered portion of the Tunnel the three passage-ways are to be reduced to one, varying from 24 to 20 feet in width, and from 20½ feet to 17½ feet in height. The whole length of the covered portion of the tunnel will be about 1,000 feet.

Proposals must be addressed to the Board of Public Works, endorsed "Proposals for Washington-st. Tunnel," and be accompanied with the usual $200 bond, with sureties, to be approved by the Board.

The Board reserve the right to reject any bid not in accordance with the conditions of this advertisement, or to reject all bids, and no proposal will be accepted unless the party offering it shall give evidence satisfactory to the Board that he has the necessary skill, experience, energy and ability for doing the work, is trustworthy, and has sufficient pecuniary resources.

J. G. GINDELE,
FRED. LEITZ,
O J. ROSE,
160 Board of Public Works.

BRAYTON'S
Patent Steam Generator,
AND ENGINE.

A PERFECT SUCCESS. BY THIS INVENTION the long sought-for object has been accomplished; to wit: A means by which steam can be generated safely, so that there shall be no more danger from explosion than with the hot air engine, and at the same time retain all the power of the steam engine. This much sought for result has at last been accomplished, and after many severe tests we feel fully warranted in offering this Steam Generator and Engine to the public as a perfectly safe power, and at the same time a cheap power. As a generator of steam for heating buildings, etc, there is not its equal in use. For further information or circular, address

R. A. HUTCHINSON,
159-182 Agent, No. 8 Dey-street, New York.

FOR SALE.

A SET OF PURIFYING BOXES, NEARLY 5 feet in diameter within, with covers and hoisting apparatus, center seal, connecting pipes, &c, with six inch openings; as good as new and in perfect order.

Offered at a low price on account of being too small for the works. Apply to or address

NEWBURGH GAS LIGHT CO.,
158 Newburgh, N. Y.

PLASTIC SLATE ROOFING
JOINT STOCK COMPANY.
OFFICE 157 [Room 19] BROADWAY,
New York.
W. C. POTTER, Vice Pres't.
J. M. ALLEN, Sec. and Treas. LICENSES GRANTED.

PLASTIC SLATE
FOR
ROOFING & OTHER PURPOSES.

The process of reconstructing Slate Stone from a disintegrated state was
PATENTED FEBRUARY 21st, 1865.
It is a combination of
Pulverized Slate & Viscous Matter,
(the latter possessing qualities of geological and chemical affinity for the former,) and is a development of one of the simple but unalterable tendencies of nature.

As a Roofing Material it Stands Unrivalled.

A mastic—it adapts itself to every shape and slope. Non-combustible, impervious, non-expansive, and undecaying.

Frost does not Crack nor Heat Dissolve it.

The only roofing material ever discovered that will resist the action of the elements as long as the structure it protects. Being susceptible of little, if any wear, from exposure, and
Perfectly Fire-Proof,
It is unequalled as a coating for Railroad and Farm Buildings, Fences, Bridges, bottoms of Vessels, Vaults, etc.

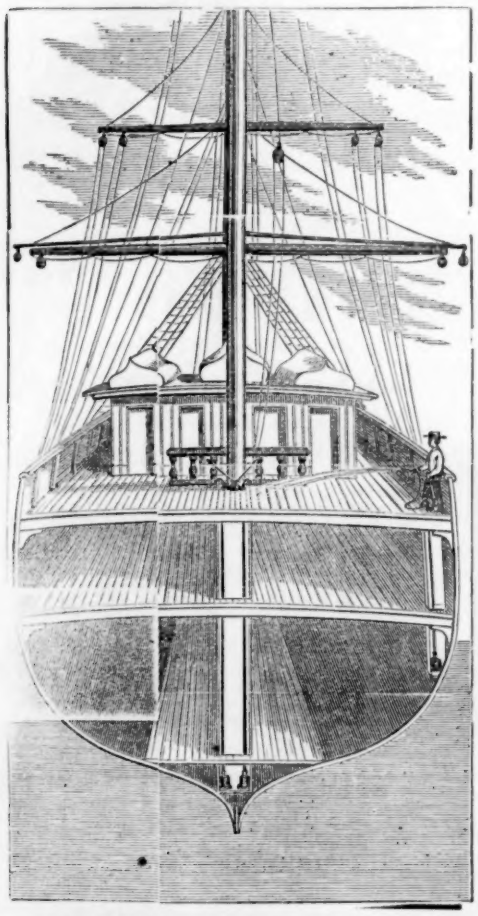
PARTZ & BUCK
Mining Engineers, Metallurgists
AND
ANALYTICAL CHEMISTS,
57 BROADWAY,
A. F. W. PARTZ, C. ELTON BUCK, NEW YORK.

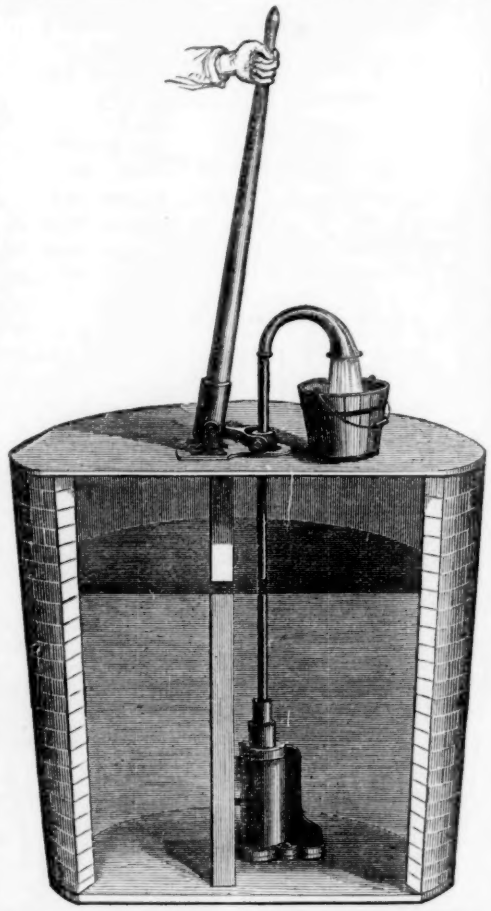
MAYNARD & TIEMANN,
Mining Engineers & Metallurgists
240 PEARL ST., NEW YORK,
—AND—
CENTRAL CITY, COLORADO.
G. W. Maynard. J. H. Tiemann.

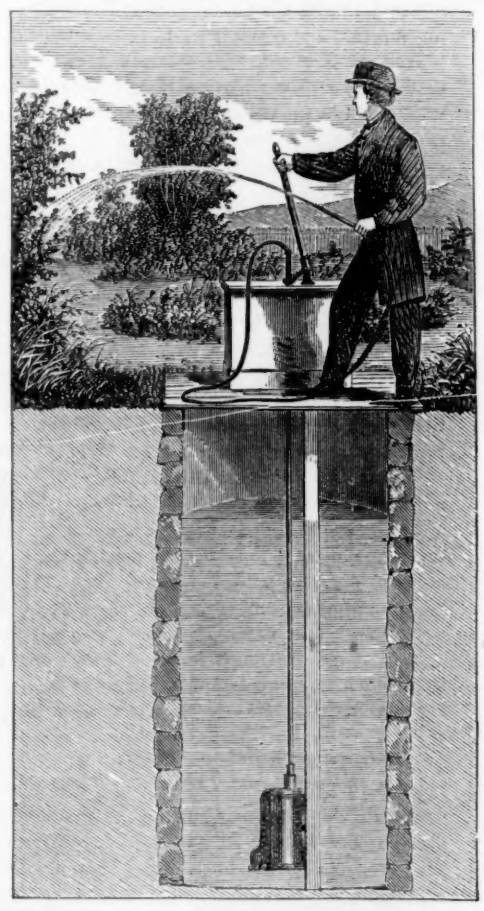
CHAS. HOWDON SMITH,
BROKER IN MINING STOCKS
AND OTHER SECURITIES,
No. 5 1-2 Pine Street,
ROOM NO. 5, NEW YORK.

T. CASSIDY & CO.,
(SUCCESSORS TO P. CASSIDY,)
Dealers in Old and New
IRON, COPPER, BRASS,
LEAD, SPELTER, &C.,
Corner of Bridge and John Streets,
BROOKLYN.
☞ N. B.—The highest cash price paid for the above named articles.
T. CASSIDY. 57-80 J. PEARCE.

NATIONAL FOUNDRY
AND PIPE WORKS.
Office and Works—Carroll, Pike, Smallman and Wilkins Streets.
PITTSBURGH, PA.
WM. SMITH,
Manufacturer of all kinds of GAS and WATER PIPE, BRANCHES, CONNECTIONS, T's, ELBOWS, and ALL CASTINGS USED AT GAS AND WATER WORKS.
I offer special inducements to parties wishing to purchase, my Pipe is Smooth, regular in weights, and cast vertically.
N. B.—Pipe from 3-inch and upwards cast in 12-ft. lengths.
☞ SEND FOR CIRCULAR AND PRICE LIST.
149







AMERICAN PUMP MANUFACTURING COMPANY,

DEPOT NO. 40 DEY STREET, NEW YORK.

A. B. VAN OLINDA, Secretary. **C. V. B. OSTRANDER**, Treasurer. **E. BEADLESTON**, President.

STATE AND COUNTY RIGHTS FOR SALE.

Pumps, completed, will be delivered from the manufactory of the Company, to parties purchasing rights at a royalty of One Dollar each.

THE PATENT SUBMERGED PUMP.

This valuable Invention, now first introduced, will, it is believed, supersede all classes for any purpose in use at the present time.

ITS ADVANTAGES.

FIRST.—SIMPLICITY. The entire pump is composed of but six parts, all of cast-iron, which can be put together by any mechanic.

SECOND.—DURABILITY. From the fact that it is always submerged, it is perfectly lubricated, and requires no packing As no water can remain in the pipe when not in motion, there is no danger of freezing.

THIRD.—CAPACITY. It is contended that, for the power applied, this Pump excels all others. The No. 1 (the smallest size,) of this Pump, with the power of one hand, has a capacity of thirty gallons per minute, and will throw a stream seventy feet in the air.

FOURTH.—CHEAPNESS. For economy, this Pump surpasses all others, its first cost being about one-third less than that of other Pumps of the same capacity, and being much less both in size and weight, there is a great saving in transportation.

ITSU SES.

FIRST.—For a House Pump; the smallest size of the patent Submerged Pump is sufficient for all family purposes. Placed in a well or cistern, water may be conveyed to every room in a common sized house.

SECOND.—For a Farm Pump; for all purposes connected with irrigating, watering stock, etc., etc. This Pump can be placed in running streams, ponds, bayous, etc., and water conveyed to any required distance.

THIRD.—For a Ship Pump; Any ship owner or captain, with short experience in the use of this Pump, will give his unqualified approval for ship purposes, either to be used as a bilge pump simply, or for washing decks, etc. From its simplicity, as a bilge Pump it will be found entirely free from choking, and will clear grain, dirt, stones, etc., with ease.

FOURTH.—For a Factory Pump, or for air in Oil Wells, for Breweries or for pumping acids, hot liquors, etc., it is invaluable It cannot be affected by any liquid.

FIFTH.—To all Directors and Officers connected with mining interests, the PATENT SUBMERGED PUMP presents great advantages

The experience of the last five years have clearly proved at what great expense both in first cost and freight, it has been necessary to be at to secure the proper means of expelling water from the mines, quarries, etc. With this Pump an immense saving is effected in both instances, as in first cost it is much less than other Pumps of the same capacity and power.

Its principle is that of a Double-acting Force Pump, with a heavy double-acting piston cast in one piece, and a double-acting iron valve within the same, without the use of leather valves or any packing whatever.

DIRECTIONS FOR ADJUSTING PUMPS.

1st. Find the exact measurement of the well or cistern from the extreme bottom to the top or curb, after which make such an allowance as may be required, above the curb or top, as will accommodate the sized vessel required to be used, and in respect to the quantity of pipe required, always deducting for the length of the Pump and the space between the bottom and the Pump. 2d. Provide a plank, to which the Pump must be secured, not less than seven inches wide by two or two and a half inches thick, which should reach from the bottom to the top of the well or cistern, always placing the plank on the side of the well or cistern. 3d. Before putting the plank into a well or cistern, fit and bolt the Pump to the plank, and screw the pipe firmly in, taking care to have the Pump not less than one foot from the bottom of a well, nor less than six inches from the bottom of a cistern. Yet, if the water be six feet deep in a well, then adjust the Pump three feet from the bottom, and in like proportion as the case will permit, always being governed by the depth of water in the well, and always observing the necessity of securing the plank at the bottom of the curb, by braces across the well, and standing perfectly plumb and solid under the platform orcovering of the well, when the fulcrum can be fastened to the platform, taking care to give the pipe free action when in motion.

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225 lbs.	26 inches.	$56 00	$15 00	$71 00
275 "	42	69 00	18 00	87 00
375	36	94 00	22 00	116 00
450	84	112 00	25 00	137 00
600	02	150 00	30 00	180 00
750	39	188 00	35 00	225 00
1,000	64	250 00	42 00	292 00
1,200	48	300 00	45 00	345 00
1,400	50	350 00	50 00	400 00
1,600	52	400 00	54 00	454 00
1,800	55	450 00	60 00	510 00
2,000	58	500 00	62 00	562 00
2,500	60	625 00	72 00	697 00
3,000	63	750 00	85 00	835 00
3,500	66	875 00	87 00	962 00
4,000	69	1,000 00	100 00	1,100 00
4,500	72	1,125 00	113 00	1,238 00
5,000	75	1,250 00	125 00	1,375 00

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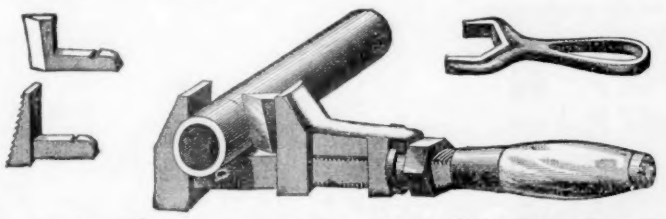

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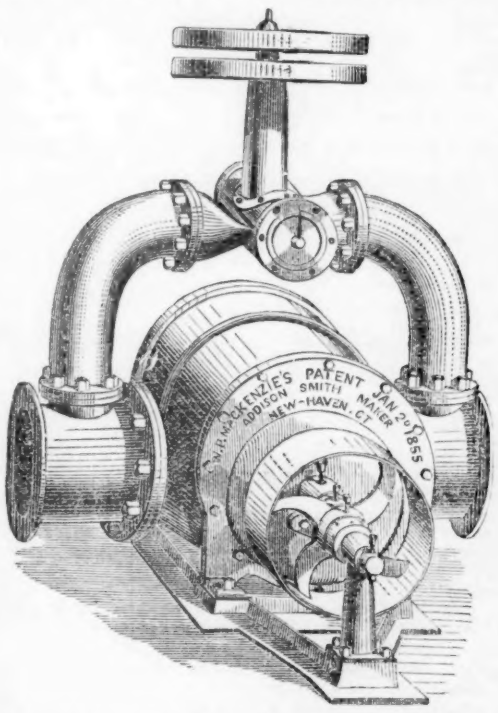

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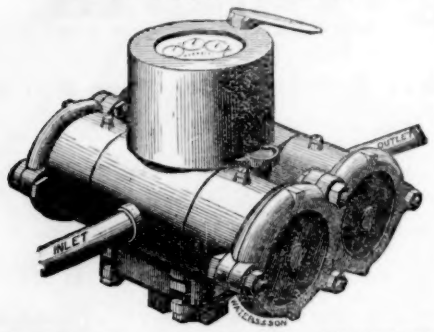

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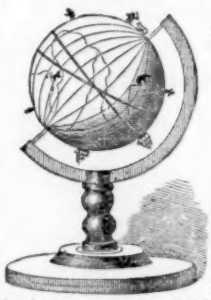

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For Rahway, *6 (stopping at Market Street only, Newark) 7, and 10 a. m. and 12, 2, 3 30, 4.10, 4.30, 5,10, 5.40, 6.20, 7.10, and 12 p. m.—Sunday, 6 p. m.

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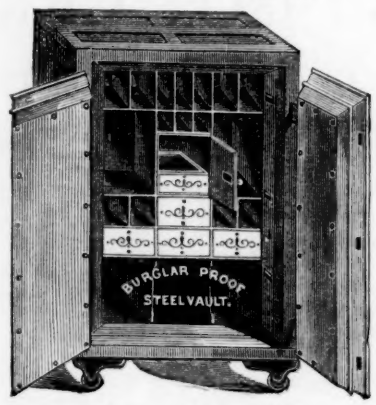

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4	21¼	21¼	13	150	3	38	24	16	350
5	26	18	13	220	4	44	24	16	400
6	22½	26	14	250	5	44	32	17	500
7	26	21	14	240	5½	40	38	17	525
8	29	24	14¼	300	6	50	32	17	550
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Shuttle Sewing Machine

Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 20 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance, it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency 389 Broadway, N. Y.

Below we give a few prices:

No. 2. Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2. Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3. Extra Oil Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

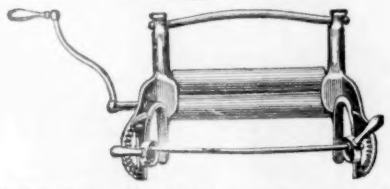
WEED SEWING MACAINE Co.,

136) 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day.

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*

That a *simple* machine is better than a complicated one.

That a Wringer should be *self-adjusting, durable, and efficient.*

That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.

That wood soaked in water will *swell, shrink,* and *split.*

That wood-bearings for the shaft to run in *will wear out.*

That the Putnam Wringer, with or without cog wheels, will *not tear the clothes.*

That cog-wheel regulators are not essential.

That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.

That all who have tried it pronounce it the *best* Wringer ever made.

That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January,* 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any,* to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.

Sample Wringers sent, express paid, on receipt of price. Manufactured and sold, wholesale and retail, by

PUTNAM MANUF'G CO.,

13 PLATT STREET, New York,
BENNINGTON, Vt.,
CLEVELAND O

WATER AND GAS PIPE.

The Boston Bituminized Pipe Company,

Are now manufacturing and prepared to take orders, for their PATENT PIPE, (from 2 to 12 inches in diameter,) as a substitute for Iron, Copper, Lead, &c., for the conveyance of WATER, GAS, SEWERAGE, &c. &c.

From the testimonials received, and the entire satisfaction it has given those having it in use, we feel warranted in claiming for this pipe over that of any other, the following advantages, viz:

It is much CHEAPER—has great strength (it having been tested to 500 lbs. to the square inch,) combined with LIGHTNESS, costing less for transportation; the joints are easily made and perfectly tight; it does not expand or contract from different degrees of temperature, and is free from *CORROSION* or *CONCRETIONS* forming; does not impart any taste or injurious properties to water, and as far as anything can be said to be indestructible, we deem this to be.

As a GAS PIPE, we say it has no superior. The Lowell Gas Light Co., purchased and laid some of this Pipe last year, and have likewise subjected samples to a test of four month's duration in their dry lime purifiers, with the most satisfactory results, in fact establishing beyond a doubt, its perfect adaptation to the wants and requirements of Gas Companies. specimens of which, together with the statement of S. Cushing, Esq., Agent Lowell Gas Light Co., who made these experiments. I shall be pleased to show, and give all other needed information, by applying in person, or by letter, to JOHN L. WEBSTER, Treas.,

Boston Bituminized Pipe Co.,

127] No. 2 Pearl st. House, Boston.

AMBROSE SPENCER GILCHRIST.

(LATE CAPT. U. S. V.,)

CIVIL, MINING

AND ARCHITECTURAL ENGINEER,

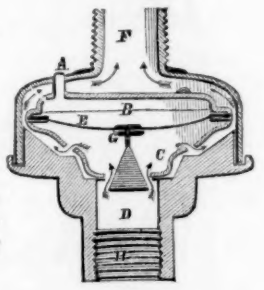
No. 200 BROADWAY, Office 12.

New York.

NOTICE TO GAS COMPANIES AND GAS CONSUMERS.

THOMPSON'S PATENT GAS CONTROLLER,

The only Self-Acting Gas Controller, Regulator, and Burner Combined which has ever been invented, or known to science.



THE PRINCIPLE UPON WHICH THE THOMPSON'S AUTOMATIC GAS CONTROLLER works is one well known to mechanics, and is simple in its operation.

Within the circumference of a small cylinder below the burner is placed a conical valve attached to a movable diaphragm. The diaphragm rises or falls as the pressure of gas from the pipe is lesser or greater, and the valve acts upon the valve-seat with such regularity of movement that in a difference of from five-tenths of an inch pressure to five inches the variation in flame is hardly perceptible.

The simplicity of its machinery and the nature of the material used in its construction insure its regular action and durability.

In consequence of the uniform quantity of gas which passes the Controller to the burner, there is no waste, and a steady, soft flame is produced, which is important to all who read, write, or work by gas light. The unsteady flickering blaze which invariably exists when the pressure of gas is beyond the requisition for consumption, has injured the sight of thousands who have been subjected to it.

For street lamps these Controllers are especially valuable, because the pressure varies materially during the night, and in consequence there is a waste of gas, and the light variable.

Improvements have lately been made in the mechanism of the Controller which makes them almost a perfect meter to each burner, and they are now offered to the public with more confidence than ever before.

Reference is permitted to the following named gentlemen—

Col. CHAS. ROOME, President Manhattan Gas Company, N. Y.
C. H. SAND, Esq., President Metropolitan Gas Company, "
J. H. ADAM, Esq., President New York Gas Company, "
PETER COOPER, Esq., Cooper Institute, "
JOHN A. DUFF, Esq., Olympic Theatre, "
GEO. H. KITCHEN, Inspector of Gas Meters, N. Y
A. L. BOGART, Esq., Gas Engineer.
Col. J. A. SABATTON, Engineer Manhattan Gas Company.
Col. A. J. WHITE, Engineer Metropolitan Gas Company.
J. K. SIMPSON, Esq., Engineer Cooper Institute.

Persons interested are invited to call at the Office, 28 Liberty street, where they can see the operation by pressure guage and test meters.

M. L GALLENDER, Agent
Office, 22 PINE STREET.

JOSEPH LEES, San Francisco, Agent for California and Oregon.

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER

TRUSTEES.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishmen, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by
HARRIS & BRO., No 1117 Cherry st., Philadelphia.

Messrs. Harris & Brother,
Philadelphia Gas Works, February 14, 1857.

Dear Sirs;—i take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000.
JOHN C. CRESSON, Engineer;

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entire satisfaction in point of wokmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.
G S. HOOKEY, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia.
Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanshipall we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, BIRKINBINE & MEARS.

Messrs. Harris & Brother.
March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their correctness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those imported from Europe, or made by any of the manufacturers in the United States. Respectfully Yours, GEORGE WIEGAND, Inspector of Gas Fittings, Philadelphia.

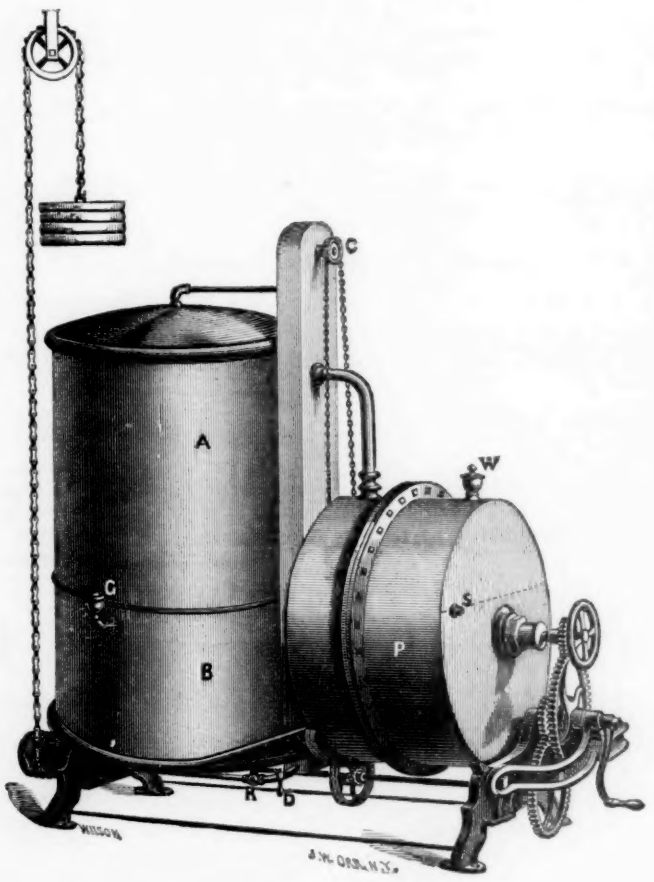
EMPIRE STATE GAS MACHINE,

LEVI STEVENS' PATENT, FOR SUPPLYING,

Dwellings. Stores, Factories and Public Buildings.

THE GAS GENERATED BY THIS MACHINE

Is a mixture of the vapor of hydro-carbon with common air. The mechanical devices employed are such as, from a long experience and critical examination into the nature of the element brought into use, seem best adapted to secure a certain and satisfactory result. GASOLINE, the liquid employed, is the more volatile portions of Petroleum, of a specific gravity of 0.6587. This liquid exposed to the action of this machine is vaporized, and a close mechanical mixture of the vapor with common air is effected. The value of the gas produced, its permanency, its illuminating quality, and freedom from liability to condensation, depend almost entirely upon the perfect and uniform character of this mixture. Hence the great importance of mechanical means adapted to secure all the conditions requisite in a Portable Gas Machine.



CASH PRICE-LIST OF MACHINES COMPLETE;

(Boxed and delivered on the cars at the Manufactory.)

No. 1,	$150,	5 Argand Burners.	
do. 2,	250,	10	do.
do. 3,	350,	20	do.
do. 4,	450,	35	do.
do. 5,	600,	60	do.
do. 6,	1,000,	125	do.
do. 7,	1,500,	250	do.

This machine will produce the most brilliant and steady light without Fire or Heat, and is warranted to operate in every respect as represented.

The EMPIRE STATE GAS MACHINE is the most SIMPLE and EFFECTIVE MEANS KNOWN FOR PRODUCING GAS WITHOUT HEAT.

Its action is automatic, feeding itself with constant supplies of Gasoline, thus securing steady and uniform supplies of Gas. The gas produced is equal to the best known Illuminating Gas. It is as economical as any other, and is adapted to a wider range of use for Lighting, Heatin and Mechanical purposes. It will maintain its illuminating power under as great a degree of cold as any other. It is free from danger with the ordinary care in using gas. Its remarkably pure and steady light is pleasant for the eye. It renders it easy for persons living remote from street gas pipes to enjoy the luxury of a pure GAS-LIGHT, at a COMPARATIVELY SMALL COST, AND WITH LITTLE TROUBLE.

☞The public are invited to witness its operations at our store. GASOLINE will be supplied by us, at market prices, or may be obtained from the various other sources of supply now going into operation.

MITCHELL, VANCE & Co., 620 Broadway, New York,

Manufacturers of Chandeliers and Gas Fixtures of every description. Also, Chandeliers, Brackets, Lamps, &c., for Coal Oil, adapted to Churches,

Public Buildings, Dwellings, &c.

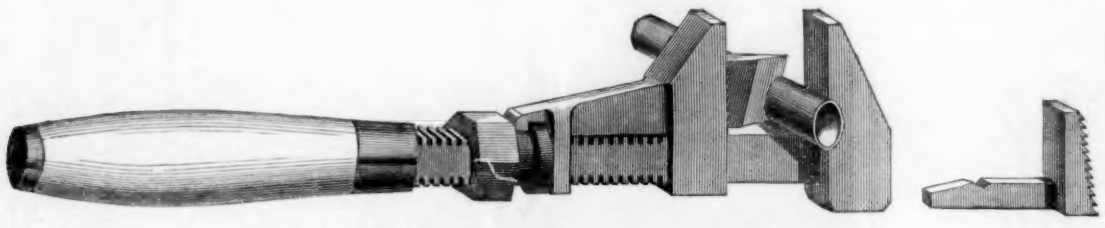
Webster's Patent Wrench.

The value of an invention does not depend upon the complication of the machinery nor the magnitude of its proportions, so much as the simple adaptation or addition of minor parts of the whole machine, whereby cheapness of construction and increased power or scope of usefulness is obtained As an example, we give the subjoined engraving, which is a fair representation of Webster's Patent Wrench, a very useful tool, intended for cutting off and screwing up all kinds of iron or brass pipe; steam, gas or water pipe; rods, bolts, nuts, etc.: besides, it is the strongest hand or monkey wrench in use, and will be found invaluable to all machinists, engineers, steam or gas-fitters, and to mechanics generally, on account of its simplicity, compactness, and strength, together with the wide range of uses to which it is adapted.

It is arranged with a socket in one of the jaws, to receive a cutting tool, as represented in the cut, or the serrated tool in lieu of it, to screw or unscrew pipe, rods, nuts, etc., which it does with certainty and ease. To cut pipe or rods, secure them in a vice—set the wrench *under* the pipe, *jaws up*, use oil freely on the pipe and in the nut; tighten the nut repeatedly with the key, (more fully shown in another cut in the advertising columns,) and turn the wrench *from* you, passing *under* the pipe. To screw and unscrew pipe, insert the clasp, and use as an ordinary wrench. To remove the cutter or clasp, strike the wrench on the bench, head down, or with a mallet, first opening the jaws. The cutter acts with surprising ease and rapidity, and will not lessen the bore of a pipe, as is the case with pressure cutters. The wrench serves the purposes of various sized pipe tongs and pipe cutters now in use, and the tools are the best of steel, and will do the work, the inventor asserts, of tools which would cost from four to six times the price of this—truly a *multum in parvo.*

A special gold medal was awarded to the patentee by the American Institute in September, 1865. Patented by Wm. Webster, of Morrisania, N. Y., February 9th, 1864.

Manufactured and for sale by Webster & Co., No. 17, Dey street, New York.



WEBSTER'S PATENT WRENCH.

The Permanent Drying up of the Mississippi.

Old steamboatmen declare that the signs of the past four or five seasons point to the permanent drying up of the Mississipi River, reducing it from a stream navigable for the largest boats the whole season to one of uncertain navigation like the Missouri, passable at certain seasons, and the rest of the year shrunk to a mere creek, winding among sand bars and shoals. There is certainly some change taking place in our climate that is affecting our lakes and rivers. They are greatly different in their habits from what they were eight or ten years ago. The average of water is steadily decreasing.

Our "June rise," once as certain as the coming of the month, has *totally ceased.* The heaviest rains, which once would have swelled the river several feet, now do not seem to affect it in the least. There are many theories advanced to explain this. One is that the climate is undergoing some change, which seems plausible, as those who have studied the meteorology of our Sate are convinced that this change is taking place. Another theory is that the cultivation of the country, destruction of forests and physical causes have tended to decrease the rainfall and retard the flowing of extra moisture into the streams. Whatever may be the cause, the effect certainly exists, and the same thing has been seen on all the Western rivers, which are gradually shrinking up. In our case, however, the evil is less to be feared, because our railroad system is so nearly developed, that river navigation is not now the necessity it was to our commercial public. The river can never again, whether it continues navigable or not, assume the important part it has hitherto played in the developement of our State. We must look to the railroad to continue our civic prosperity. Destined to be a railroad centre of the greatest importance, the trade and commerce hitherto brought to us by the river must always continue. —*St. Paul (Minn.) Pioneer, July* 8.

Voltaic Action.

Messrs. Editors:—In an interesting article written for the San Francisco *Mining & Sciectific Press* by Mr. Edward Pique, entitled "Source of the electric current in the Galvanic Battery," I observe reference is made to the following experiment described in Dr. Bird's Natural Philosophy, to prove that the different metals, by mere contact, produce electricity without any exciting fluid whatever:

Two discs of different metals, when pressed together and suddenly separated, assume opposite electric states.

To demonstrate this, take a plate of copper and one of zinc, about four inches in diameter, each furnished with a glass handle fixed in its center; now connect a gold leaf electrometer with one plate, A, of the condenser, allowing the other plate B, on the condenser to be connected with the earth. Press the copper and zinc plates together, holding them by their insulating handles; suddenly separate and apply one of them to the plate, A, of the condenser; again press them together, having previously touched them with the finger to restore their electric equilibrium, and reapply the same plate to the same condenser. Repeat this about six times; then draw back the uninsulated plate, B, and the gold leaves of the electrometer will diverge with positive electricity if the zinc, and with the negative if the copper plate has been applied to the condenser.

It is generally understood that electricity may be excited, or called into activity by mechanical action, by chemical action, by heat, and by magnetic influence. Why the above enumerated means should develop electricity, or excite it from a latent or neutral condition is as generally conceded to be an open question among philosophers. In the above experiment I think I observe another form of the well known instrument invented by Prof. Volta, which he called the "Electrophorus"—signifying "producer of electricity." It consists of a simple disc of resin or other non-conducting material, and a metallic plate of less diameter supplied with a glass handle. Hold the metallic plate by the handle, and bring it in contact with the resin and touch the finger to the plate; then withdraw the finger, remove the plate by the glass handle, when it will be found electrical; and by repeating the experiment rapidly a spark will be eventually obtained from the metallic plate, which may be employed to light gas, and for various interesting experiments. This may be aided by first exciting the resin by friction with dry cloth such woolen, silk, etc. This is sometimes called inductive electricity. In the experiment of the simple contact of the metal and resin, it is possible that the friction of the *air* as it rushes between the plates when suddenly separated may produce electro dynamic action; and I opine that in Dr. Bird's experiment with two metallic plates the same cause may produce a similar effect. But aside from this—or in connection with it, perhaps—I would like to inquire if the thin film of intervening air may not be the exciting fluid or medium which produces the electricity as exhibited by the electrometer, and especially as it is seldom free from humidity or moisture, which must assist the chemical action of oxydisation which never can occur without developing electricity. C.

Colorado Mining, etc.

Reports from the vicinity of Black Hawk, Gilpin Co., Colorado, go to show that mining interests are improving, and the general belief is that mining matters generally are going to be very brisk from this time forward. A year ago miners' wages were $5 00 a day, and other hands $4 75. Now the first are working for $4 00, and the latter for $3 50. Then, contracts for drifting ranged from $25 to $30 per foot; now from $15 to $18. The adoption of a more improved economical and practicable system of mining, taught by experience, produces equal results with one-half the labor; and these conditions are constantly improving. For instance: in former times Lee, Judd & Lee employed from 150 to to 225 hands, and 47 to 52 stamps; now, since the organization of the Black Hawk G. M. Co. they run 80 heavy stamps, and employ but 90 men, working more ore than before. The Foote & Simmons mines are in good shape, and through good management are paying well. The Black Hawk Company are taking out from $3,500 to $5,000 per week.

Slate Quarries.—The largest slate quarries in the world are situated near Llandegai, in North Wales.—The workings have produced enormous chasms in which three thousand men are employed, and the slate forms entire mountains, Every day a thousand tons of slate are taken down to the port to be shipped, and costs on an average about $50 per ton. The chasms are so deep that it makes one dizzy to look at the men working below. Men may be seen suspended by ropes against the precipitous sides of the slate rock, busily splitting down every projecting shelf of the blue steganium. The blasts occur every hour similtaneously, the effect of which strike the beholder with awe and solemnity. The magnitude of these works cannot fail to surprise every visitor, and give an enlarged idea of the commerce in slates.

THE MINING & PETROLEUM STANDAR AND AMERICAN GAS-LIGHT JOURNAL, is published at No. 22 Pine Street opposite the Sub-Treasury Building on the 2d and 16th of every month, and is a recognized official organ of—

LIGHT, HEAT, MINING INTERESTS.

PETROLEUM, WATER-SUPPLY, AND

SCIENTIFIC SUBJECTS GENERALLY.

TERMS.

Subscription—Three dollars per annum in advance.

Advertisements.—One dollar per inch in column for each insertion. Large space or long time by special contract.—Payable in advance.

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Great Britain....Trubner & Co., 60 Paternoster Row, London.
France. ..... Le Journal de l'Eclairage au Gaz, 25 Boulevard Poissonnière.

☞ All communications to be addressed to "The Editors," No. 22 Pine Street, New York

SEPT. 30, 1865